

**A REVISION OF THE GENUS *MACROSIPHONIELLA* DEL GUERCIO  
(HEMIPTERA: APHIDIDAE) FROM THE KOREAN PENINSULA, PART II:  
SUBGENUS *MACROSIPHONIELLA* (SENSU STRICTO)**

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*Abstract.*—Thirteen species of the subgenus *Macrosiphoniella* del Guercio sensu stricto (Hemiptera: Sternorrhyncha: Aphididae) are recorded from the Korean Peninsula, including *Macrosiphoniella* (*M.*) *capillaricola*, **n. sp.** (apt. & al.) and *Macrosiphoniella* (*M.*) *pseudotanacetaria*, **n. sp.** (apt. & al.). The former is from South and North Korea, found on *Artemisia capillaris* Thunb. and *A. japonica* Thunb. The latter is from North Korea, found on an unidentified Asteraceae: Anthemideae. *Macrosiphoniella* (*M.*) *kikungshana* ssp. *sylvaticae* Szelegiewicz is synonymized with its respective nominate taxon (**new synonymy**). A key to apterous viviparous females of the Korean species in the subgenera *Macrosiphoniella* and *Asterobium* (in part: *M.* (*A.*) *yomenae* (Shinji)) is given, and a list of host plants for all *Macrosiphoniella* species of the Korean Peninsula is also presented. In addition, descriptions and measurements of the new species, and microscopic photos of all Korean species treated are given.

*Key Words:* Hemiptera, Aphididae, *Macrosiphoniella*, Korea, list of host plants, Korean Peninsula

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As the second part of “The Genus *Macrosiphoniella* del Guercio (Hemiptera: Aphididae) from the Korean Peninsula,” this paper includes 13 species of the nominate subgenus *Macrosiphoniella* del Guercio. All species are listed in alphabetical order, disregarding phylogenetic relationships. Five subgenera of the genus *Macrosiphoniella* (*Asterobium*, *Chosoniella*, *Papillomyzus*, *Phalangomyzus*, and *Sinosiphoniella*) were treated in the first part of this study (Holman et al. 2006).

#### MATERIALS AND METHODS

Most specimens and all holotypes used in this study are deposited in the College of

Agriculture and Life Sciences, Seoul National University (CAL SNU, Korea) and the National Institute of Agricultural Sciences and Technology (NIAS, Suwon, Korea), and some paratypes and other specimens are deposited in the Institute of Entomology, Czech Academy of Sciences (IE CAS, České Budějovice, Czech Republic). A list summarizing the host plants of all the *Macrosiphoniella* spp. of the Korean Peninsula is given in Table 2.

Abbreviations used are as follows: al.—alate viviparous female, alata; Ant.—antennae; Ant.I, III, VIb—antennal segment I, III, base of VI, respectively; apt.—apterous viviparous female, aptera; BDAnt.III—bas-

al diameter of antennal segment III; BL—length of body; C—cauda; HFEM—hind femur; HTIB—hind tibia; HT2—second segment of hind tarsus; HW—width of head across the compound eyes; PT—processus terminalis; SIPH—siphunculi; URS—ultimate rostral sement (segment IV + V). Provincial names of North and South Korea for the collection data: PN—Pyounggannando; RG—Ryanggangdo; HB—Hwanghaebukdo; HN—Hwanghaenamdo; GG—Gyeonggido; GW—Gwangwondo; CB—Chungcheongbukdo; CN—Chungcheongnamdo; GN—Gyeongsangnamdo; JB—Jeollabukdo; JN—Jeollanamdo.

Names of plants with an asterisk (\*) indicate new host records for the respective species of aphid.

KEY TO SPECIES OF THE SUBGENERA  
MACROSIPHONIELLA AND ASTEROBIUM  
(IN PART) OF THE KOREAN PENINSULA

Apterous viviparous females

- 1. Siphunculi pale (at least at base), cauda pale or dusky (e.g., Fig. 1B). Abdomen without sclerotization (e.g., Fig. 1A). . . . . 2
  - Siphunculi and cauda entirely dark brown to black (Fig. 2B). Abdomen usually with some sclerotized, dark areas (e.g., Fig. 3A). . . . . 3
- 2. Head uniformly dusky to brownish, concolorous with Ant.I and Ant.II. Frons concave. URS shorter than HT2. Longest hairs on Ant.III and on anterior abdominal terga 1.0–1.3 times as long as BDAnt.III. On *Artemisia annua* L and *A. iwayomogi* Kitam. (Fig. 1) . . . . . *M. (M.) abrotani chosoni* Szelegiewicz
  - Head and Ant.I dark brown to black, Ant.II pale to smoky. Frons not concave, nearly straight. URS longer than HT2. Longest hairs on Ant.III, up to twice as long as BDAnt.III and, and longest hairs on anterior abdominal terga 2.5–3.5 times as long as BDAnt.III. On *Artemisia princeps* Pamp., *A. feddei* H. Lev. & Vaniot, *A. mongolica* Fisch. Ex Bess., and *A. gmelini* Webb. Ex Stechm (Fig. 13) . . . . . *M. (M.) taesongsanensis* Szelegiewicz
- 3. Tibiae uniformly dark, sometimes with middle part paler but never concolorous with body (Fig. 2C) . . . . . 4
  - Tibiae with middle part pale, concolorous with body (Fig. 10C) . . . . . 11
- 4. Primary rhinaria naked or with very short cilia and distinctly protruding membrane . . . . 5
  - Primary rhinaria ciliate, usually with cilia

- bent over the flat or slightly convex membrane . . . . . 7
- 5. Dark green in life. Body more than 3 mm long. Siphunculi up to 0.9 times as long as cauda. Secondary rhinaria more than 30, irregularly arranged on basal half of Ant.III. URS short, at most 0.9 times as long as HT2. On *Tanacetum boreale* Fisch. Ex DC. (Fig. 11) . . . . . *M. (M.) pseudotanacetaria*, n. sp.
  - Shiny black in life. Body less than 3 mm long. Siphunculi more than 0.9 times as long as cauda. URS long, more than 0.93 times as long as HT2. Secondary rhinaria 1–15 in one row on basal 1/2–1/2 of Ant.III. — 6
- 6. Trochanters and basal 1/2–1/2 of femora pale. URS maximum 1.1 times as long as HT2, 0.75–1.0 times as long as Ant.I, 0.7–1.0 times as long as Ant.VIb. On *Artemisia capillaries* Thunb. (Fig. 3) . . . . *M. (M.) capillaricola*, n. sp.
  - Trochanters dark, femora pale, at most on basal 1/4. URS long, narrow, 1.25–1.40 times as long as HT2, about 1.1–1.6 times as long as Ant.I, and 1.0–1.4 times (rarely less than 1.1 times) as long as Ant.VIb. On various *Artemisia* spp., including *A. capillaries* Thunb. (Fig. 5) . . . . *M. (M.) formsartemisiae* Takahashi
- 7. Hind tibia with dorso-posterior row of short, thorn like hairs, different from other tibial hairs. On *Artemisia iwayomogi* Kitam (Fig. 7) . . . . . *M. (M.) jaroslavi* Szelegiewicz
  - Hind tibia without a row of short, thorn like hairs. Dorso-posterior hairs not differing substantially from other tibial hairs . . . . . 8
- 8. Abdominal dorsum with well-developed, dark antesiphuncular sclerites and with large sclerites at base of dorsal hairs (Fig. 2A) . . . . 9
  - Abdominal dorsum membranous with no distinct sclerotization, rarely with faint antesiphuncular sclerites, and with small sclerites on terga 7 and 8 (Fig. 6A) . . . . . 10
- 9. Body widely oval, 1.5–2.6 mm long. Dorsal hairs about 2.5 times as long as BDAnt.III. Accessory hairs on URS much longer than the apical hairs. On various *Artemisia* and *Tanacetum boreale* Fisch. Ex DC. (Fig. 2) . . . . . *M. (M.) atra latysiphon* Holman and Szelegiewicz
  - Body slender, 2.5–4.0 mm, but rarely less than 2.8 mm long. Dorsal hairs less than 2 times as long as BDAnt.III. Some accessory hairs on URS short, not exceeding apical hairs in length. On *Aster*, *Erigeron* and some *Artemisia* spp. . . . . *M. (Asterobium) yomenae* (Shinji) (see Part. I, Holman et al. 2005)
- 10. Body yellowish green or pinkish in life, without wax powder. Coxae and trochanters pale, femora pale on basal 1/6–1/4 and gradually darker toward apex. Ant.I (outer side) 0.12–0.15

- mm long,  $\frac{2}{5}$ – $\frac{3}{4}$  of URS. On various *Artemisia*. (Fig. 6) . . . . . *M. (M.) hokkaidensis* Miyazaki
- Body green in life, covered with fine wax powder. Legs including coxae black except extreme base of femora. Ant.I (outer side) 0.16–0.19 mm,  $\frac{1}{5}$  of, or equal to URS. On various *Artemisia* spp., *Chrysanthemum* spp., *Dendranthema morifolium* (Ramat) Tzvelev, *Tanacetum boreale* Fisch. Ex DC. (Fig. 14) . . . . . *M. (M.) yomogifoliae* (Shinji)
11. Primary rhinaria ciliate. Green in life, abdominal dorsum without scleroites at base of dorsal hairs. On various *Artemisia* spp. (Fig. 10) . . . . . *M. (M.) pseudoartemisiae* Shinji
- Primary rhinaria naked. Shiny brown to black in life, usually with scleroites at base of some dorsal hairs . . . . . 12
12. Anterior abdominal terga each with maximum 15 hairs. Antennal hairs maximum 1.5 times as long as BDAnt.III . . . . . 13
- Anterior abdominal terga each with 24 or more hairs. Antennal hairs 2.5 or more times as long as BDAnt.III. On *Artemisia* spp. (Fig. 8) . . . . . *M. (M.) kikungshana* Takahashi
13. URS longer than HT2, with 6 accessory hairs. Abdominal dorsum without or with only small scleroites at base of some hairs. Cauda with distinct constriction, bearing 17–21 hairs. Secondary rhinaria 10–25, irregularly distributed on basal  $\frac{1}{2}$  to entire length of Ant.III. On *Tanacetum*, *Dendranthema*, *Chrysanthemum* and some *Artemisia* spp. (Fig. 12) . . . . . *M. (M.) sanborni* (Gillette)
- URS shorter than HT2, with 4 accessory hairs. Abdominal dorsum with rather large scleroites at base of nearly all hairs. Cauda elongate triangular, usually without distinct constriction, bearing 13–15 hairs. Secondary rhinaria 1–2 on basal third of Ant.III. On *Artemisia japonica* Thunb. (Fig. 9) . . . . . *M. (M.) oronensis* Szelegiewicz

Subgenus *Macrosiphoniella* del Guercio, sensu stricto

- Macrosiphoniella* del Guercio 1911: 331.  
Type species: *Siphonophora atra* Ferrari 1872 by original designation.
- Pyrethromyzus* Börner 1950: 15. Type species: *Macrosiphum sanborni* Gillette 1908 by original designation.
- Mediosiphum* Wojciechowski 1993: 108.  
Type species: *Mediosiphum caucasicum* Wojciechowski 1993 by monotypy.

*Macrosiphoniella (M.) abrotani chosoni*  
Szelegiewicz 1980  
(Fig. 1)

*Macrosiphoniella (M.) abrotani chosoni*  
Szelegiewicz 1980: 427

Specimens examined.—NORTH KOREA: Taesong-san (Botan. Garden), Pyongyang-si, PN, 30.v.1988, on *Artemisia annua* (88Ha2699, 88Ha2700, 88Ha2701, 88Ha2702: apt. & al.); Taesong-san, Pyongyang-si, PN, 6.vi.1988, on *Artemisia annua* (88Ha2856, 88Ha2865: apt. & al.).

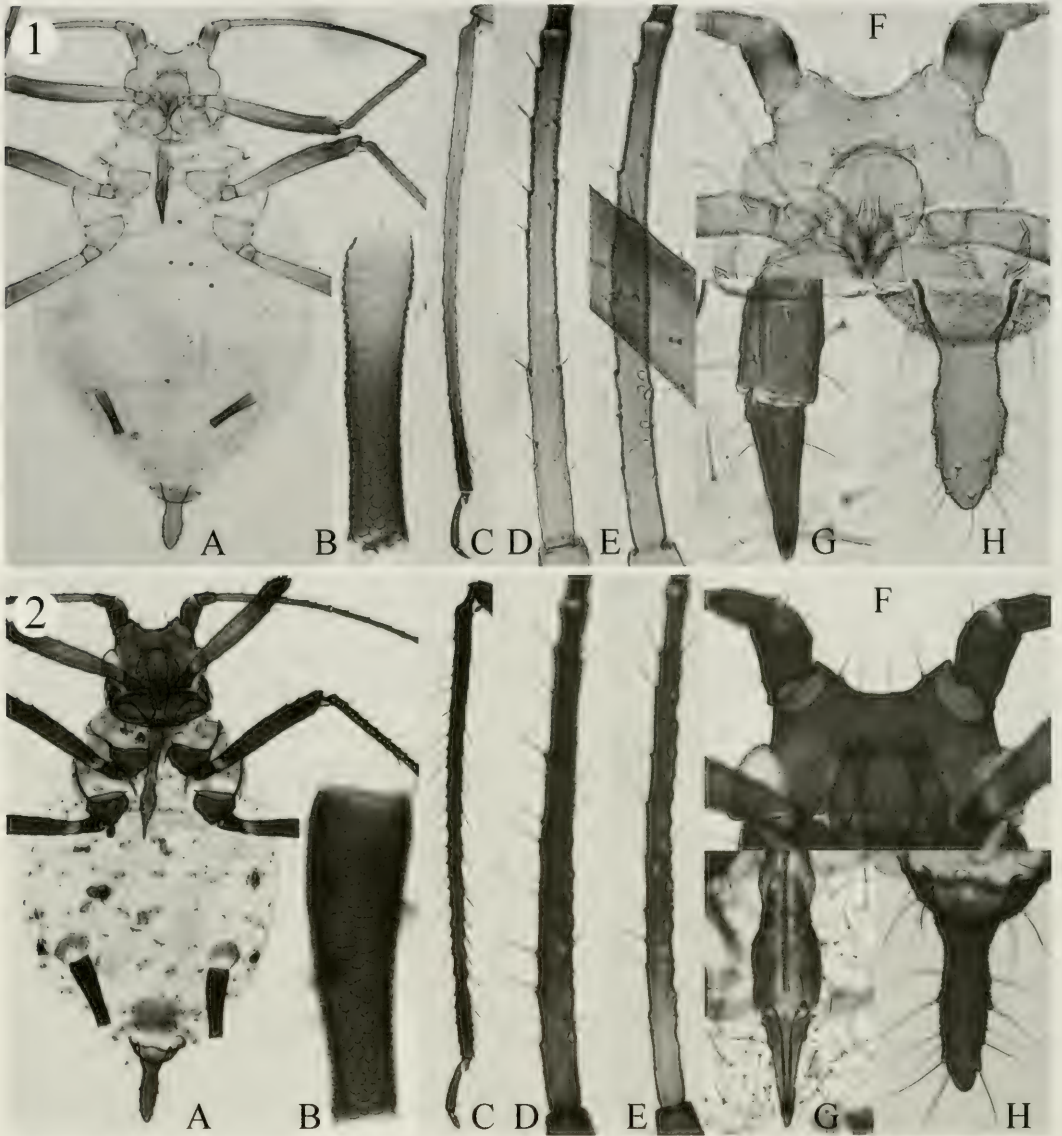
Distribution.—Korea (North), Russia (Far East).

Host plants.—*Artemisia (annua* L., *ipayomogi* Kitam., *montana* Fisch. Ex Bess.), *Tanacetum boreale* Fisch. Ex DC. (Pashchenko 1998).

*Macrosiphoniella (M.) atra latysiphon*  
Holman and Szelgiewicz 1978  
(Fig. 2)

*Macrosiphoniella (M.) atra latysiphon* Holman and Szelgiewicz 1978: 181

Samples examined.—NORTH KOREA: Chonryong-san, Pyongsong-si, PN, 7.vi.1985, on *Artemisia gmelini* (85Ha405: apt. & al.); Hyesan, RG, 8.vii.1985, on *Artemisia japonica* (85Ha1523: apt. & al.); Puryong, Chongjin, HB, 17.vi.1987, on *A. iwayomogi* (87Ha1837, 87Ha1838, 87Ha1839: apt.); Hyeryong, 18.vi.1987, on *A. iwayomogi* (87Ha1870, 87Ha1872: apt. & al.); Chongryong-san, Pyongsong-si, PN, 29.vi–6.vii.1987, on *A. japonica* & *A. iwayomogi* (87Ha2056, 87Ha2150: apt. & al.); Taesong-san, Pyongyang-si, PN, 2–4.vi.1988. *A. iwayomogi* (88Ha2758, 88Ha2763, 88Ha2765, 88Ha2767, 88Ha2768, 88Ha2769, 88Ha2770, 88Ha2771, 88Ha2887: apt. & al.); Hyesan, RG, 26.vi.1988, on *A. iwayomogi* (88Ha3206: apt.); Paekun-san (Paektu Mts. reg.), RG, 29–30.vi.1988, *Artemisia capillaris* & *A. iwayomogi* (88Ha3342, 88Ha3346, 88Ha3347, 88Ha3355: apt. & al.). SOUTH KOREA: Mountain Vegetable



Figs. 1–2. Apterous viviparous female (unless otherwise indicated). 1 (top), *Macrosiphoniella (M.) abrotani chosoni*. 2 (bottom), *Macrosiphoniella (M.) atra latsiphon*. A, Entire body. B, Siphunculus. C, Hind tibia and tarsus. D, Antennal segment III. E, Antennal segment III of alate viviparous female. F, Head and antennal segment I–II. G, Ultimate rostral segment. H, Cauda.

Experimental Station, Pyongchang-gun, GW, 2.vi.1999, on *A. iwayomogi* (990602–18SH: apt.); Guidun-ri, Inje, GW, 4.vi.1999, on *A. iwayomogi*, (990602–70SH: apt.); Jinan Medicinal Herbs Experimental Station, Jinan, JB, 20.vi.2000, on *A. iwayomogi*, (000620-SH15: apt.); North Agricultural Experimen-

tal Station, Andong, GB, 25.ix.2000, on *A. iwayomogi*, (000925-SH19: apt.); Yeonhwagyegok, Yeongwoel, GW, 2.vi.2001, *A. iwayomogi* (01Ho240A: apt.); Mountain Vegetable Experimental Station, Pyongchang-gun, GW, 31.v.2001, *A. iwayomogi* (01Ho173B, 01Ho174C: apt. & al.).

Distribution.—Korea (North, South), Mongolia, Russia (Far East).

Host plants.—*Artemisia* (*adamsii* Bess., \**capillaris* Thunb., *gmelini* Webb. Ex Stechm., *ipayomogi* Kitam., \**japonica* Thunb., \**maritime* L., *tanacetifolia* L.), *Tanacetum boreale* Fisch. Ex DC. (Patshenko 1998).

Notes.—This species is most common in North Korea. As already noted by Szelegiewicz (1980), the Korean specimens agree well with Mongolian type material of the subspecies *latysiphon*. In our samples, a few specimens have up to 20 secondary rhinaria confined to nearly the entire Ant.III (5–14 on basal half in the types of *latysiphon*).

***Macrosiphoniella (M.) capillaricola***  
**Holman, Lee, and Havelka, new species**  
 (Figs. 3–4, Table 1)

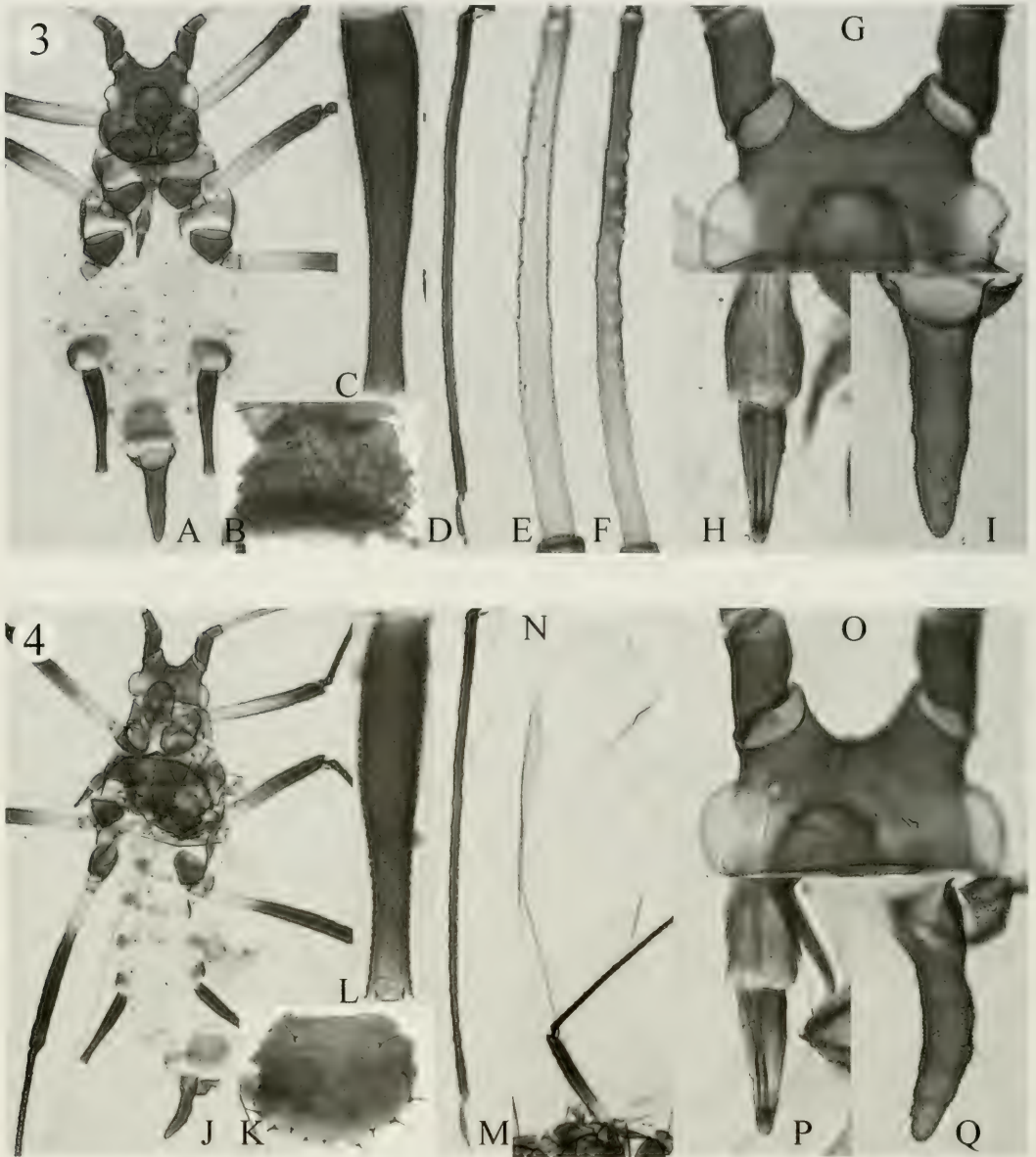
Apterous viviparous female.—*Color*: In life dark brown to shiny black, nymphs reddish brown. In cleared specimens head brown; antenna dark brown with Ant.III. (in some specimens also Ant.IV) pale at base, toward apex gradually darker; legs dark brown with pale trochanters and pale basal half of femora; middle part of tibiae brown or dusky, paler than base and distal part but never concolorous with abdomen; abdomen pale with brown sclerites and scleroites; siphunculi and cauda uniformly dark to blackish brown.

*Morphological characters*: Body 2.0–2.8 mm long. Frons moderately concave with diverging antennal tubercles. Frontal and occipital hairs finely pointed, up to 0.075 mm long, about twice as long as BDAnt.III. Antenna usually equal to or slightly longer than body; Ant.I 0.32–0.41 of head width, with 1 (rarely 2) hair on outer side and 4–5 hairs on distal half, in addition to short dorsal hair at base; processus terminalis 3.00–4.41 times as long as Ant.VIb; antennal hairs slightly capitate, subequal to BDAnt.III. Secondary rhinaria protruding, 2–9 on basal  $\frac{2}{5}$ – $\frac{3}{5}$  of Ant.III; primary rhinaria naked. Rostrum reaching

to hind coxae. URS stiletto-shaped, 0.14–0.16 mm long, with 5–6 accessory hairs. Legs relatively long, HFEM and HTIB 0.35–0.37 and 0.66–0.70 of body length, respectively. Abdominal dorsum membranous with scleroites at base of hairs on terga 1–7, large antesiphuncular sclerites and a transverse sclerotized bar on tergum 8. Dorsal abdominal hairs slightly capitate, up to 0.11 mm long, about twice as long as BDAnt.III, 8–12 on tergum 3, 4–5 on tergum 6 between siphunculi, and 4–7 on tergum 8. Marginal tubercles absent. Siphunculi bottle-shaped, 0.14–0.21 of body length, 0.95–1.25 times as long as cauda, strongly imbricate on basal half and reticulate on distal half; flange not developed. Cauda elongate tongue-shaped with a slight or without any distinct constriction, bearing 10–16 hairs. Genital plate widely oval, with 2 (rarely 3) long hairs mesially located on anterior half and 6–10 shorter hairs along hind margin. For measurements and comparison with *M. (M.) yomogifoliae*, see Table 1.

Alate viviparous female.—*Color*: In life shiny dark brown. In cleared specimens thorax dark brown. Wing venation pale. *Morphological characters*: Secondary rhinaria 13–15 in one row on nearly entire Ant.III. Abdomen with large marginal sclerites on segments 2–4. Otherwise, similar to apterous viviparous female.

Type materials.—Holotype: Apterous viviparous female (Coll.# 010620-SH07/ in the collection of CALS SNU), Mishiryong, Wontong, Inje, GW, SOUTH KOREA, 20.vi.2001, on *Artemisia capillaris*, leg. Seunghwan Lee. Paratypes: 28 apt. and 1 al. (coll.# 85Ha359), Chongryong-san, Pyongsong Distr., PN, NORTH KOREA, 7.vi.1985 on *Artemisia capillaris*, leg. Jan Havelka; 4 apt. (coll.# 88Ha2531 & 88Ha2531), Onjong-ri (Kumkang Mts.), GW, NORTH KOREA, 23.v.1988, on *Artemisia capillaris*, leg. Jan Havelka; 35 apt., 2 al. (88Ha3228, 88Ha3342, 88Ha3349, 88Ha3351 & 88Ha3416), Paekun-san (Paektu Mts. Reg.), NORTH KOREA,



Figs. 3-4. *Macrosiphoniella (M.) capillaricola*. 3 (top), Apterous viviparous female (unless otherwise indicated). 4 (bottom), Alate viviparous female. A, Entire body. B, genital plate. C, Siphunculus. D, Hind tibia and tarsus. E, Antennal segment III. F, Antennal segment III of alate viviparous female. G, Head and antennal segment I-II. H, Ultimate rostral segment. I, Cauda. J, Whole body. K, Genital plate. L, Siphunculus. M, Hind tibia and tarsus. N, Forewing. O, Head and antennal segment I-II. P, Ultimate rostral segment. Q, Cauda.

29.vi.1988, *Artemisia capillaris*, leg. Jan Havelka; 1 apt. (Coll.# 99Ho665), Kuidun-ri, Inje-gun, GW, SOUTH KOREA, 04.vi.1999, on *Artemisia japonica*, leg. Jaroslav Holman; 4 apt. (Coll.# 990528-9SH),

Daebu-do, Ansan, GG, SOUTH KOREA, 28.v.1999, on *Artemisia capillaris*, leg. Seunghwan Lee; 4 apt. (Coll.# 010620-SH07), Mishiryong, Wontong, Inje, GW, SOUTH KOREA, 20.vi.2001, on *Artemisia*

*capillaris*, leg. Seunghwan Lee; 11 apt. (Coll.#990825-GS26), Hyeryong-myon, Yeosu, JN, SOUTH KOREA, 25.viii.1999, on unknown *Artemisia*; 3 apt. & 2 al. (Coll.# 000605-SH82, 000605-SH106), Naribunji, Ulreungdo, GB, SOUTH KOREA, 8–9.vi.2000, on *Artemisia capillaris*, leg. Seunghwan Lee; 4 apt. & 3 al. (000605-SH06–1, 000605-SH25), Dodong, Ulreungdo, GB, SOUTH KOREA, 5–6.vi.2000, on *Artemisia capillaris*, leg. Seunghwan Lee.

Distribution.—Korea (North, South).

Host plants and biology.—Nearly exclusively found on *Artemisia capillaris* Thunb., only one specimen found on *A. japonica*. Lives on stems of the host plant, sometimes (and in this case) together with *M. formosartemisiae*, which prefers terminal parts. Presumably monoecious and holocyclic. Alatae are more likely common later in the season.

Etymology.—Latin, “*capillaricola*,” means “living on (*Artemisia capillaris*),”

Systematic position.—By color in life, pigmentation of the tibiae, naked primary rhinaria, shape of the frons, and the presence of scleroites on abdominal dorsum, *M. (M.) capillaricola* resembles *M. (M.) formosartemisiae*, with which it also shares its main host plant. It differs from the latter (data in parenthesis) in having 1) URS maximum 1.1 times as long as HT2 (1.25–1.40 times) and subequal to or shorter than Ant.I (distinctly longer); 2) pale trochanters concolorous with the base of femur (dark, concolorous with coxa); and 3) slightly capitate hairs on dorsum and appendages (blunt or abruptly pointed). *Macrosiphoniella (M.) capillaricola* is somewhat more slender, has longer appendages, and has relatively shorter siphunculi than *M. (M.) formosartemisiae*. As a result, the ratio SIPH/HFEM in the types is maximum 0.6 (minimum 0.61 in specimens measured).

*Macrosiphoniella (M.) formosartemisiae*

Takahashi 1921

(Fig. 5, Table 1)

*Macrosiphoniella formosartemisiae* Takahashi 1921: 15.

*Macrosiphoniella (M.) formosartemisiae*: Szelegiewicz 1980: 469.

Specimens examined.—Numerous apterous and alate viviparous females throughout the Korean Peninsula, from the southernmost Jeju-do, north to the Yongkwang District, North Korea, on *Artemisia* spp. (*capillaris*, *japonica*, *stolonifera*, *princeps*, and *scoparia*).

Distribution.—Korea (North, South), China (Fukien, Szechuan), Japan (Honshu, Kyushu), Mongolia, Taiwan, India.

Host plants.—*Artemisia* spp. (*capillaris* Thunb., *japonica* Thunb., *keiskeana* Miq., *princeps* Pamp., *scoparia* Waldst. & Kit., *rubripes* Pamp., \**stolonifera* (Maxim.) Kom.).

Notes.—Okamoto and Takahashi (1927) reported this species from South Korea. This is the first record from North Korea.

*Macrosiphoniella (M.) hokkaidensis*

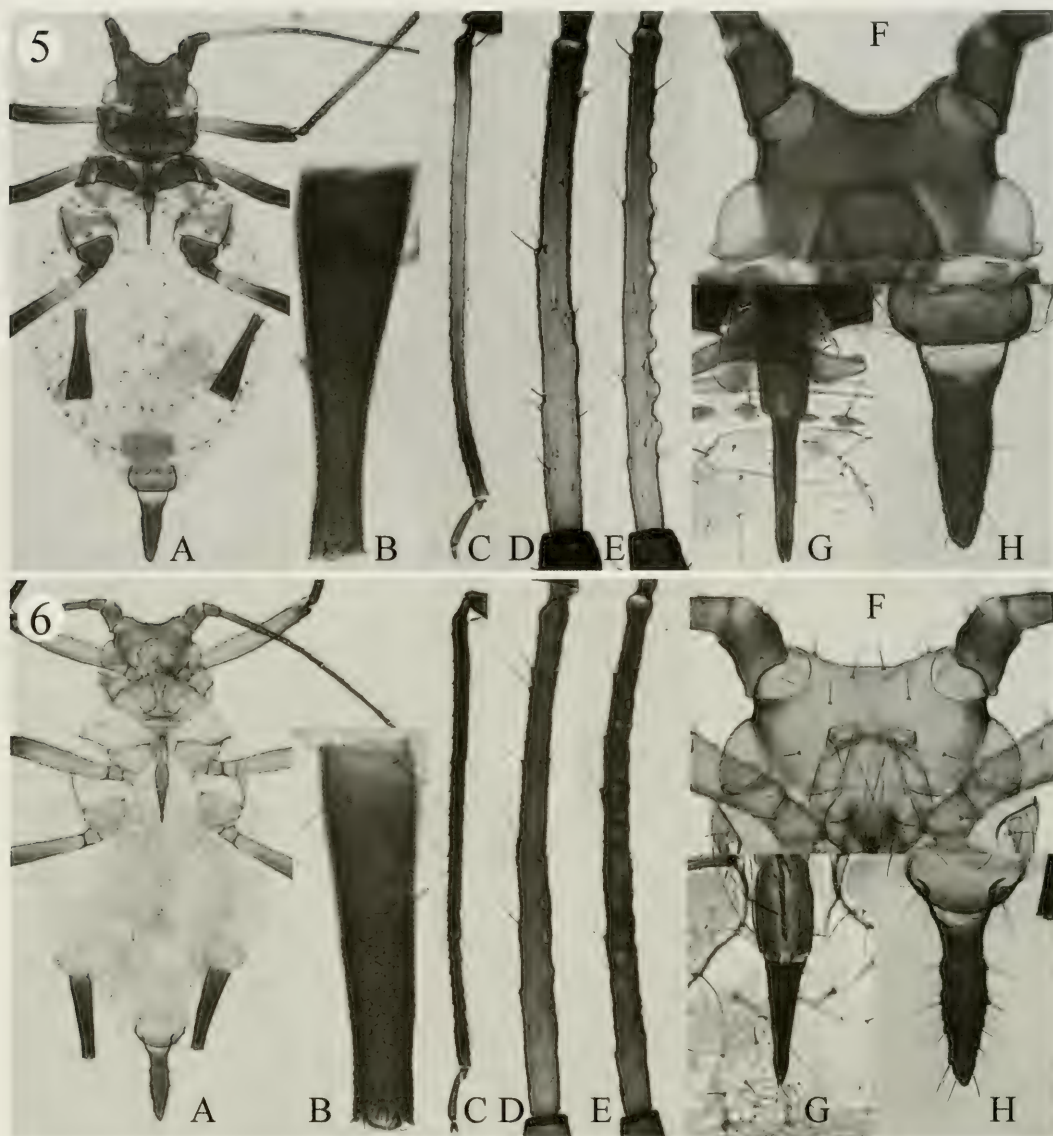
Miyazaki 1971

(Fig. 6)

*Macrosiphoniella hokkaidensis* Miyazaki 1971: 27.

*Macrosiphoniella (M.) hokkaidensis*: Szelegiewicz 1980: 469.

Samples examined.—NORTH KOREA: Tokol, Myohang-san Region, PN, 16.vi.1985, on *Artemisia rubripes* (85Ha797: apt.); Chonryong-san, Pyongsong dist., PN, 18.vii.1985, on *Artemisia mongoliaca* (85Ha1445, 85Ha1451: apt. & al.); Puryong, Chongjin Dist., HB, 17.vi.1987, on *Artemisia mongolica* (87Ha1834: apt.); Hyeryong, RG, 18.vi.87, on *Artemisia mongolica* (87Ha1867: apt.); Myohang-san, PN, 26.vi.1987, on *Artemisia vulgaris* (*A. lavandulaefolia*) (87Ha2020: apt. & al.). SOUTH KOREA: Bongpyong-myon, Pyongchang-gun, GW, 3.vi.1999, on *A. argyi* & *A. montana* (99Ho579C, 99Ho588: apt.); 990725–1SH, Mt. Myongji-san, Gapyong, GG, 25.vii.1999, on unknown *Artemisia*; 990602–13SH, Mountain Vegetable Experimental Station, Pyongchang, GW,



Figs. 5-6. Apterous viviparous female (unless otherwise indicated). 5 (top), *Macrosiphoniella (M.) formosartemisiae*. 6 (bottom), *Macrosiphoniella (M.) hokkaidensis*. A, Entire body. B, Siphunculus. C, Hind tibia and tarsus. D, Antennal segment III. E, Antennal segment III of alate viviparous female. F, Head and antennal segment I-II. G, Ultimate rostral segment. H, Cauda.

2.vi.1999, on unknown *Artemisia*; 990512-09SH, Hwanggan, Yongdong, CB, 12.v.1999, on *Artemisia princeps*.

Host plants.—*Artemisia* (\**argyi* Lev. & Van., *feddei* Lev. & Van., *gmelini* Webb. Ex Stechm., *montana*(Nakai) Pamp., *mongolica* Fisch. Ex Bess., *rubripes* Pamp., *selen-*

*gensis* Turcz. ex Bess., *sieversiana* var. *ko-reana* (Nakai) W.Wang & C.Y.Li, *stolonifera* (Maxim.) Kom., *vulgaris* L. (incl. var. *indica*)).

Distribution.—Japan (Hokkaido), Korea (North, South), Russia (Maritime Territory).

Notes.—*Macrosiphoniella (M.) hokkai-*



*densis* is related to *M. (M.) yomogifoliae*, with which it shares uniformly dark tibiae, the same type of secondary rhinaria and ventral chaetotaxy of the head (1–3 additional lateroventral hairs present in most specimens). It differs from the latter (data in parenthesis) in having pale basal 0.3–0.5 of femora, trochanters and coxae (as a rule, legs entirely dark except narrow zone at bases of femora); antennae subequal to or shorter than body (slightly longer than body); shorter Ant.I and, as a result, the ratio URS/Ant.I distinctly higher, 1.37–1.73 (1.00–1.22). The legs in *M. (M.) hokkaidensis* are relatively shorter and siphunculi longer (SIPH/HFEM = 0.47–0.60 in comparison with 0.32–0.47). For measurements and comparison with *M. (M.) yomogifoliae* see Table 1.

*Macrosiphoniella (M.) jaroslavi*  
Szelegiewicz 1980  
(Fig. 7)

*Macrosiphoniella (M.) jaroslavi* Szelegiewicz 1980: 430.

Samples examined.—NORTH KOREA: Toksan-ri, ca. 12 km N. Hamhung, HN, 14.ix.1966, on *Artemisia iwayomogi*, leg. Szelegiewicz (Coll.# 3450: 3 apt.); Chonsan-ri, 10 km S. Wonsan, GW, 3.ix.1966, on *Artemisia iwayomogi*, leg. Szelegiewicz (Coll.# 3365: 3 apt.); Pyongyang, PN, 18.vii.1959, on *Artemisia* sp., leg. Pisarski & Proszynski (Coll. # 1954: 3 apt.); Taesong-san, Pyongyang-si, PN, 22.viii.1966, on *Artemisia iwayomogi*, leg. Szelegiewicz. (Coll.# 3295: 4 apt., 1 al.) (all paratypes).

Distribution.—Korea (North).

Host plant.—*Artemisia iwayomogi* Kitam., *Artemisia* sp.

Notes.—This is one of the few species of *Macrosiphoniella* with peglike hairs on the hind tibiae. Otherwise, it is not substantially different from other *Artemisia*-inhabiting species of the subgenus *Macrosiphoniella*. No additional samples have been collected on the Korean Peninsula or in neighboring countries.

*Macrosiphoniella (M.) kikungshana*  
Takahashi 1937  
(Fig. 8)

*Macrosiphoniella kikungshana* Takahashi 1937: 54.

*Macrosiphoniella (M.) kikungshana*: Szelegiewicz 1980: 433.

*Macrosiphoniella (M.) kikungshana* ssp. *sylvaticae* Szelegiewicz 1980: 436. **New synonymy.**

Samples examined.—NORTH KOREA: Samilpho, Kumkang Mts., GW, 6.vi.1987, on *Artemisia stolonifera* (87Ha1681, 87Ha1706, 87Ha1712: apt. & al.); Taesong-san, PN, 19.ix.1966, leg. H. Szelegiewicz, on *Artemisia vulgaris* var. *indica* (Szel. no. 3479, 2 apt., paratypes); Songkon-am, PN, 25.ix.1966, on *A. vulgaris* var. *indica*, leg. H. Szelegiewicz (Szel. no. 3538; 5 apt., paratypes); Myohang-san (Sangwon-am), HN, 23.ix.1966, on *A. sylvatica*, leg. H. Szelegiewicz (Szel. no. 3498, 2 apt., paratypes of ssp. *sylvaticae*). SOUTH KOREA: Daebu-do, Ansan, GG, 18.x.2000, on *A. princeps* (001018-TM13: oviparae); Yeosan Rest Area, Homan Express Way, Nonsan, CN, 8.xi.2000, on *A. princeps* (001108-TM07: oviparae); Jookrim, Sora, Yeosu, JN, 9.xi.2000, on unknown host (001108-SH19: oviparae).

Distribution.—Korea (North, South), China (Honan, Szechuan, Chekiang), India (Sikkim), Russia (Far East).

Host plants.—*Artemisia* spp. (*keiskeana* Miq., *stolonifera* (Maxim.) Kom., *sylvatica* Maxim., *vulgaris* L. (incl. var. *indica*)).

Notes.—Szelegiewicz (1980) described the subspecies *M. (s. str.) kikungshana* ssp. *sylvaticae* from specimens collected on *Artemisia sylvatica*. This subspecies has hairs on abdominal terga, maximum 2.8 times as long as BDant.III (3.7–5 times as long as in *kikungshana* sensu stricto), pale femora with only small rings at basal thirds, and darker apical part. Examining the paratypes of *sylvaticae* and our additional samples, we found that the pigmentation of the hind femora is variable. The dorsal hairs are also



Figs. 7-8. Apterous viviparous female (unless otherwise indicated). 7 (top), *Macrosiphoniella (M.) jaroslavi*. 8 (bottom), *Macrosiphoniella (M.) kikungshana*. A, Entire body. B, Siphunculus. C, Hind tibia and tarsus. D, Antennal segment III. E, Antennal segment III of alate viviparous female. F, Head and antennal segment I-II. G, Ultimate rostral segment. H, Cauda.

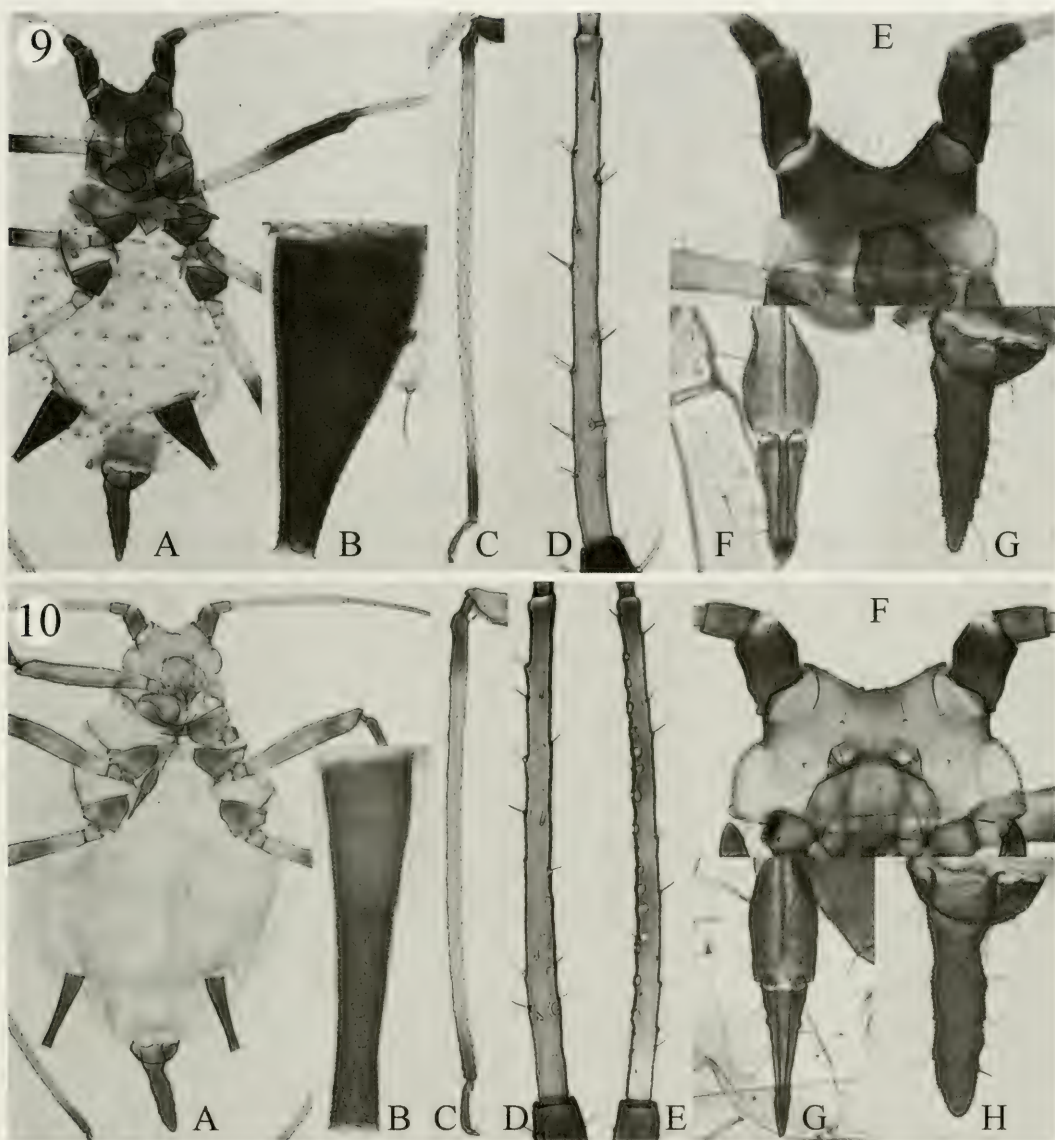
variable, but mostly longer than 3.7 times as long as the BD<sub>Ant.III</sub>, even in the paratype of *sylvaticae*. Therefore, we conclude that subdivision of *M. (s. str.) kikungshana* into two subspecies is not justified.

*Macrosiphoniella (M.) oronensis*

Szelegiewicz 1980

(Fig. 9)

*Macrosiphoniella (M.) oronensis* Szelegiewicz 1980: 438.



Figs. 9–10. Apterous viviparous female (unless otherwise indicated). 9 (top), *Macrosiphoniella (M.) oronensis*: A, Entire body; B, Siphunculus; C, Hind tibia and tarsus; D, Antennal segment III; E, Head and antennal segment I–II; F, Ultimate rostral segment; G, Cauda. 10 (bottom), *Macrosiphoniella (M.) pseudoartemisiae*: A, Entire body; B, Siphunculus; C, Hind tibia and tarsus; D, Antennal segment III; E, Antennal segment III of alate viviparous female; F, Head and antennal segment I–II; G, Ultimate rostral segment; H, Cauda.

Specimens examined.—NORTH KOREA: Oro, ca. 19 km NW Hamhung, HN, 15.ix.1966, on *Artemisia japonica*, leg. H. Szelengiewicz (Szel. no. 3495a: 3 apt., paratypes).

Distribution.—Korea (North).

Host plant.—*Artemisia japonica* Thunb.

Notes.—This species seems to be rather rare. No additional specimens have been collected since Szelegiewicz (1980) de-

scribed it from 5 apterous viviparous females.

*Macrosiphoniella (M.) pseudoartemisiae*  
Shinji 1933  
(Fig. 10)

*Macrosiphoniella pseudoartemisiae* Shinji  
1933: 216.

*Macrosiphoniella (M.) pseudoartemisiae*:  
Szelegiewicz, 1980: 469.

Samples examined.—Fifteen samples containing numerous apterous and alate viviparous females collected throughout the Korean Peninsula, from the southernmost Jeju-do, north to the Paektu-san Region, North Korea, on *Artemisia* spp. (*annua*, *argyi*, *capillaris*, *feddei*, *gigamea*, *japonica*, *montana*, *rubripes*, *stolonifera*, *princeps*, and *scoparia*).

Distribution.—China (Shantung, Szechuan, Sikong), Korea (South, North), Japan (Honshu, Kyushu), India, Sikkim, Bhutan, Russia (Far East).

Host plants.—*Artemisia* (*annua* L., *\*argyi* Lev. & Van., *capillaris* Thunb., *\*feddei* Lev. & Van., *\*gigamea* Kitam., *\*iwayomogi* Kitam., *\*japonica* Thunb., *mongolica* Fisch. Ex Bess., *princeps* Pamp., *rubripes* Pamp., *scoparia* Waldst. & Kit., *\*stolonifera* (Maxim.) Kom.), *Chrysanthemum coronarium* L.

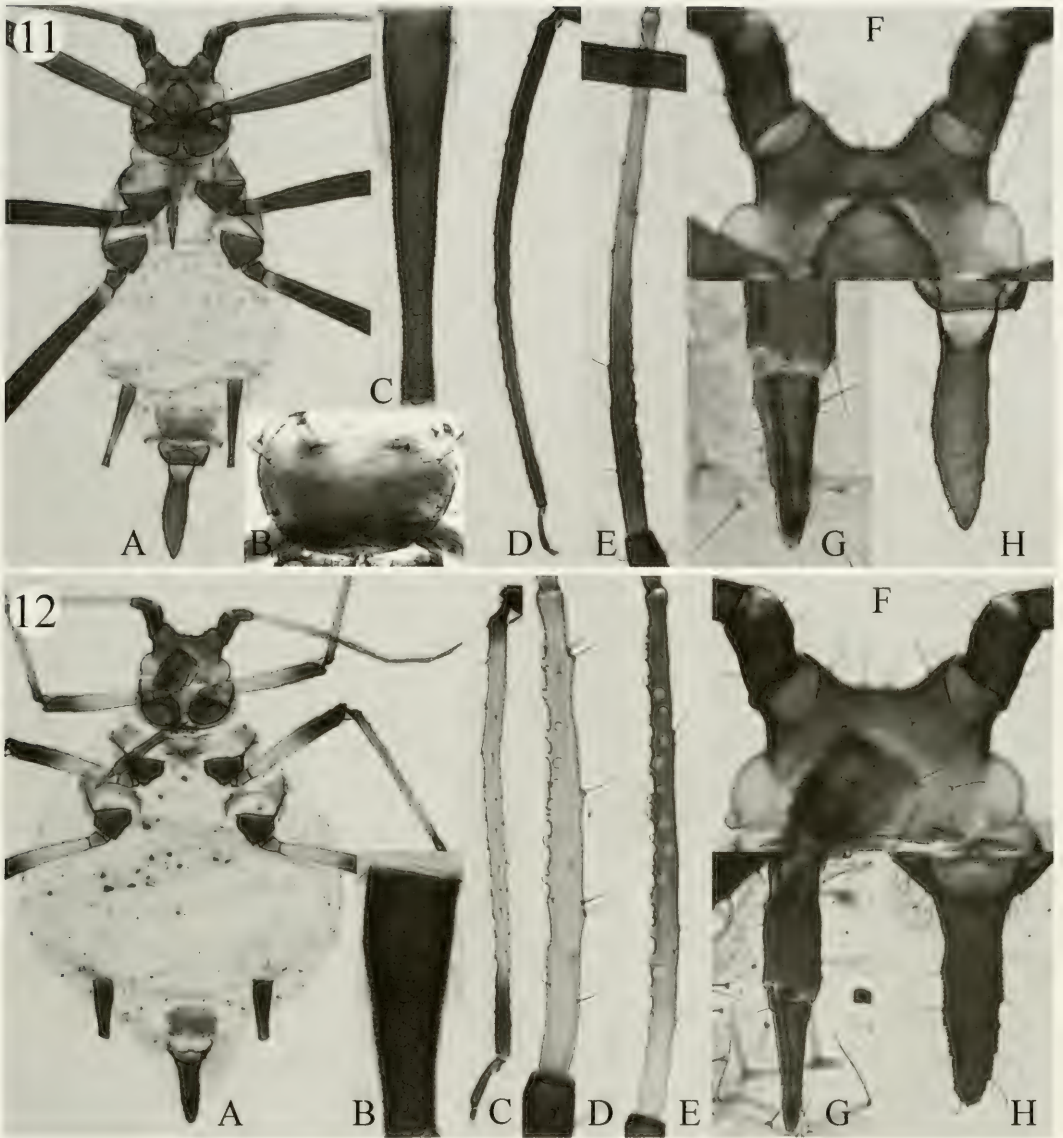
Notes.—Paik (1965) recorded this species from South Korea. This is a new record of this species for North Korea.

*Macrosiphoniella (M.) pseudotanacetaria*  
**Holman, Lee, and Havelka, new species**  
(Fig. 11, Table 1)

Apterous viviparous female.—*Color*: In life dark green with black appendages. In cleared specimens, head dark brown, antenna dark brown to blackish with base of Ant.III paler; thorax and abdomen pale with pale brown to brown sclerotized areas; legs including coxae brown to blackish brown with paler or smoky narrow zone at base of femora; siphunculi, cauda, and anal plate brown to blackish brown; genital plate brown.

*Morphological characters*: Body 3–4 mm long. Frons deeply sinuate; antennal tubercles well developed with 3–4 hairs on inner side; dorsal cephalic hairs finely pointed, 1.6–2.2 times as long as BDAnt.III. Antenna 1.10–1.35 times as long as body; Ant.I subequal to or slightly shorter than HT2 with 7–12 long hairs; process terminalis 3.2–3.6 times as long as AntVib, 0.75–0.95 of Ant.III. Antennal hairs abruptly pointed, the longest hair on Ant.III equal to or slightly longer than BDAnt.III. Secondary rhinaria 18–35, protruding, often on elevated sockets, relatively small (0.005–0.020 mm in diameter), irregularly distributed on posterior surface of basal half of Ant.III. Primary rhinaria with protruding membrane surrounded by wide rims; cilia very short or indiscernible. Rostrum attaining metathoracic coxae; URS wedge-shaped, 0.72–0.80 of HT2, 0.55–0.65 of AntVib, 0.25–0.29 of HW, with 6 (rarely 5) accessory hairs. Legs relatively long, hind tibia 0.62–0.80 times as long as BL; dorsal tibial hairs 1.0–1.5 times as long as the diameter of hind tibia at mid point; HT2 with two dorsal and four ventral hairs apart from three apical pairs; first tarsal segments with 3,3,3 hairs. Abdominal dorsum membranous with distinct, faintly pigmented scleroites at base of hairs, wide antehumeral sclerites and sclerotized bar on tergum 8; dorsal abdominal hairs blunt or abruptly pointed, 1.00–1.35 times BDAnt.III, 16–23 on tergum 3, 4 on tergum 6 between siphunculi, and (6)8–11 on segment 8. SIPH spinulate and imbricate on basal  $\frac{3}{5}$  and reticulate on distal  $\frac{2}{5}$ , 0.7 times shorter than cauda. Cauda elongate tongue-shaped with a constriction at basal  $\frac{1}{3}$  and with ca. 30 hairs. Genital plate dark brown, with 4 long hairs medially on anterior half and 10 short ones along the posterior margin. For measurements see Table 1.

Alate viviparous female.—*Color*: In cleared specimens, meso- and metathorax dark brown, concolorous with head. Wings pale. Otherwise, similar to apterae. *Morphological characters*: Ant.III with ca. 50



Figs. 11–12. Apterous viviparous female (unless otherwise indicated). 11 (top), *Macrosiphoniella (M.) pseudotanacetaria*: A, Entire body; B, Siphunculus; C, Hind tibia and tarsus; D, Antennal segment III; E, Head and antennal segment I–II; F, Ultimate rostral segment; G, Cauda. 12 (bottom), *Macrosiphoniella (M.) sanborni*: A, Entire body; B, Siphunculus; C, Hind tibia and tarsus; D, Antennal segment III; E, Antennal segment III of alate viviparous female; F, Head and antennal segment I–II; G, Ultimate rostral segment; H, Cauda.

secondary rhinaria scattered over entire segment. Other characters are as those in apterae.

Type material.—Holotype: (apterous viviparous female, Coll.# 87Ha1883/apt.2 in the collection of CALS SNU): Mupho,

Paektu-san region, RG, NORTH KOREA, 11.vii.1985, leg. Jan Havelka, on an unidentified Asteraceae. Paratypes: 9 apterous viviparous females and 7 alate viviparous females with the same collection data as the holotype (Coll.# 85Ha1878, 85Ha1883).

Table 1. Measurements (ranges) of apterous viviparous females of Korean *Macrosiphoniella* (*Macrosiphoniella*) *capillaricola*, *M. (M.) formosartemisiae*, *M. (M.) hokkaidensis*, *M. (M.) yomogifoliae*, and *M. (M.) pseudotanacetaria*.

Taxon:	<i>M. (M.) capillaricola</i>	<i>M. (M.) formosartemisiae</i>	<i>M. (M.) hokkaidensis</i>	<i>M. (M.) yomogifoliae</i>	<i>M. (M.) pseudotanacetaria</i>
No. of Specimens/Samples	46/9	43/7	44/6	38/13	10/2
Lengths (in mm)					
BL	1.96–2.87	0.76–2.76	2.44–3.44	2.50–3.90	3.50–3.90
Ant.	2.29–2.90	1.44–2.52	2.15–3.11	2.58–3.32	4.35–4.40
SIPH	0.32–0.58	0.35–0.54	0.36–0.60	0.34–0.52	0.56–0.59
C	0.32–0.48	0.29–0.48	0.38–0.58	0.45–0.61	0.71–0.79
URS	0.13–0.16	0.15–0.18	0.17–0.21	0.18–0.22	0.15–0.17
HT2	0.13–0.15	0.11–0.14	0.15–0.19	0.17–0.21	0.21–0.23
HW	0.44–0.53	0.38–0.48	0.49–0.58	0.47–0.64	0.62–0.64
Ant.I	0.15–0.19	0.10–0.16	0.12–0.15	0.16–0.19	0.19–0.21
Ant.VIb	0.15–0.21	0.12–0.17	0.16–0.24	0.22–0.27	0.25–0.31
Ratios					
Ant./BL	0.93–1.18	0.77–1.00	0.76–1.04	0.83–1.16	1.13–1.24
SIPH/BL	0.14–0.21	0.18–0.23	0.14–0.21	0.10–0.16	0.15–0.16
SIPH/C	0.98–1.24	0.93–1.28	0.88–1.14	0.65–0.92	0.76–0.83
URS/HT2	0.93–1.14	1.25–1.40	1.02–1.22	0.93–1.20	0.73–0.76
URS/Ant.I	0.75–0.99	1.08–1.62	1.37–1.73	1.00–1.22	0.79–0.83
URS/Ant.VIb	0.66–0.98	1.00–1.43	0.85–1.13	0.74–0.89	0.58–0.63
URS/HW	0.27–0.32	0.35–0.43	0.34–0.38	0.31–0.37	0.26–0.28
SIPH/HW	0.76–1.10	0.91–1.27	0.72–1.07	0.63–0.88	0.87–0.95
SIPH/HFEM	0.50–0.59	0.61–0.73	0.47–0.60	0.32–0.47	0.38–0.49
HT2/HW	0.27–0.31	0.26–0.31	0.29–0.35	0.28–0.36	0.35–0.36
HT2/Ant.VIb	0.62–0.91	0.72–1.10	0.75–0.99	0.68–0.81	0.76–0.85
Ant.VIb/Ant.I	0.92–1.20	0.90–1.29	1.39–1.88	1.21–1.72	1.26–1.40
Ant.VIb/HW	0.33–0.42	0.28–0.36	0.32–0.42	0.36–0.49	0.41–0.54
Ant.I/HW	0.32–0.41	0.25–0.34	0.22–0.27	0.28–0.34	0.33–0.35
PT/Ant.VIb	3.00–4.40	3.05–4.20	2.23–3.09	2.57–3.50	3.19–3.62

Host plant.—Asteraceae sp.

Etymology.—The species name “*pseudotanacetaria*” means “false *tanacetaria*.”

Systematic position.—*Macrosiphoniella* (*M.*) *pseudotanacetaria* sp. n. coincides with *M. (M.) tanacetaria* (Kaltenbach 1843) in nearly all characters (Kaltenbach 1843). It differs from the latter (data in parenthesis) in having 1) primary rhinaria with strongly protruding membrane surrounded by wide rims bearing short, fine cilia, best discernible on Ant.V (membrane of the primary rhinaria flat or moderately convex, rims narrow, cilia stout, long, bent over the membrane); 2) scleroites on abdominal dorsum faintly pigmented (not discernible),

and 3) primary rhinaria in apterous viviparous female distributed on nearly entire Ant.III (usually confined to basal half of Ant.III in *M. (M.) tanacetaria*).

*Macrosiphoniella* (*M.*) *sanborni* (Gillette 1908)  
(Fig. 12)

*Macrosiphum sanborni* Gillette 1908: 65.  
*Macrosiphum nishigahara* Essig et Kuwana 1918: 50.

*Pyrethromyzus sanborni*: Börner, 1950: 15.  
*Macrosiphoniella* (*Pyrethromyzus*) *sanborni*: Eastop 1958: 44.

Specimens examined.—11 samples containing numerous apterous and alate vivip-

arous females collected throughout the Korean Peninsula from the southernmost Jeju-do north to Ryongak-san and Pyongsongsi, North Korea, on *Artemisia* spp. (*mongolica*, *stolonifera*), *Tanacetum boreale*, and *Dendranthema indicum*.

Distribution.—Worldwide (spread with the trade of *Dendranthema* spp. (cultivated *Chrysanthemum*).

Host plants.—*Argyranthemum frutescens* Sch.Bip., *Artemisia* spp. (*japonica* Thunb., *\*mongolica* Fisch. Ex Bess., *princeps* Pamp. (incl. var. *orientalis*), *\*stolonifera* (Maxim.) Kom.), *Chrysanthemum* spp. (*coronarium* L., *ornatum* Hemsl., *yezoense* Maekawa), *Dendranthema* spp. (*indicum* Des Moul., *japonense* (Nakai) S.Kitamura, *lavandulifolium* (Fisch.ex Trautv.) Y.Ling & C.Shih, *morifolium* (Ramat) Tzvelev, *zawadskii* (Herbich) Tzvelev), *Tanacetum boreale* Fisch. Ex DC.

*Macrosiphoniella* (*M.*) *taesongsanensis*  
Szelegiewicz 1980  
(Fig. 13)

*Macrosiphoniella* (*M.*) *taesongsanensis*  
Szelegiewicz 1980: 440.

Specimens examined.—NORTH KOREA: Taesong-san, Pyongyang-si, PN, 22.vii.1966, on *Artemisia princeps*, leg. H. Szelegiewicz (Szel. no. 3293: 1 apt., paratype); Nampho, HN, 20.vii.1999, on *A. japonica* & *A. mongolica* (86Ha655, 85Ha656, 85Ha660: apt. & al.); Banchaksan, Pyongyang Dist., PN, 8.vi.1985, on *A. gmelini* (86Ha666: apt. & al.); Taesong-san (Botan. Garden), Pyongyang-si, PN, 7.vi.1988, on *A. feddei* (88Ha2895, 88Ha2899, 88Ha2900, 88Ha2901, 88Ha2902, 88H2903: apt. & al.); Hyesan, RG, 26.vi.88, on *A. gigantea* (88Ha3211: apt. & al.); Ryongak-san, 1.vii.88, on *A. mongolica* (88Ha3414, 88Ha3415: apt. & al.). SOUTH KOREA: Daebudo, GG, 28.v.1999, on *A. feddei* (99Ho241b, 99Ho249c: apt.).

Distribution.—Korea (North, South), Russia (Far East).

Host plants.—*Artemisia* spp. (*\*feddei* Lev. & Van., *\*gigamea* Kitam., *mongolica* Fisch. Ex Bess., and *princeps* Pamp. (incl. var. *orientalis*).

*Macrosiphoniella* (*M.*) *yomogifoliae*  
(Shinji 1922)  
(Fig. 14)

*Macrosiphum yomogifoliae* Shinji 1922:  
788.

*Macrosiphoniella yomogifoliae*: Takahashii  
1931: 61.

*Macrosiphoniella* (*Macrosiphoniella*) *yomogifoliae*: Szelegiewicz 1980: 443.

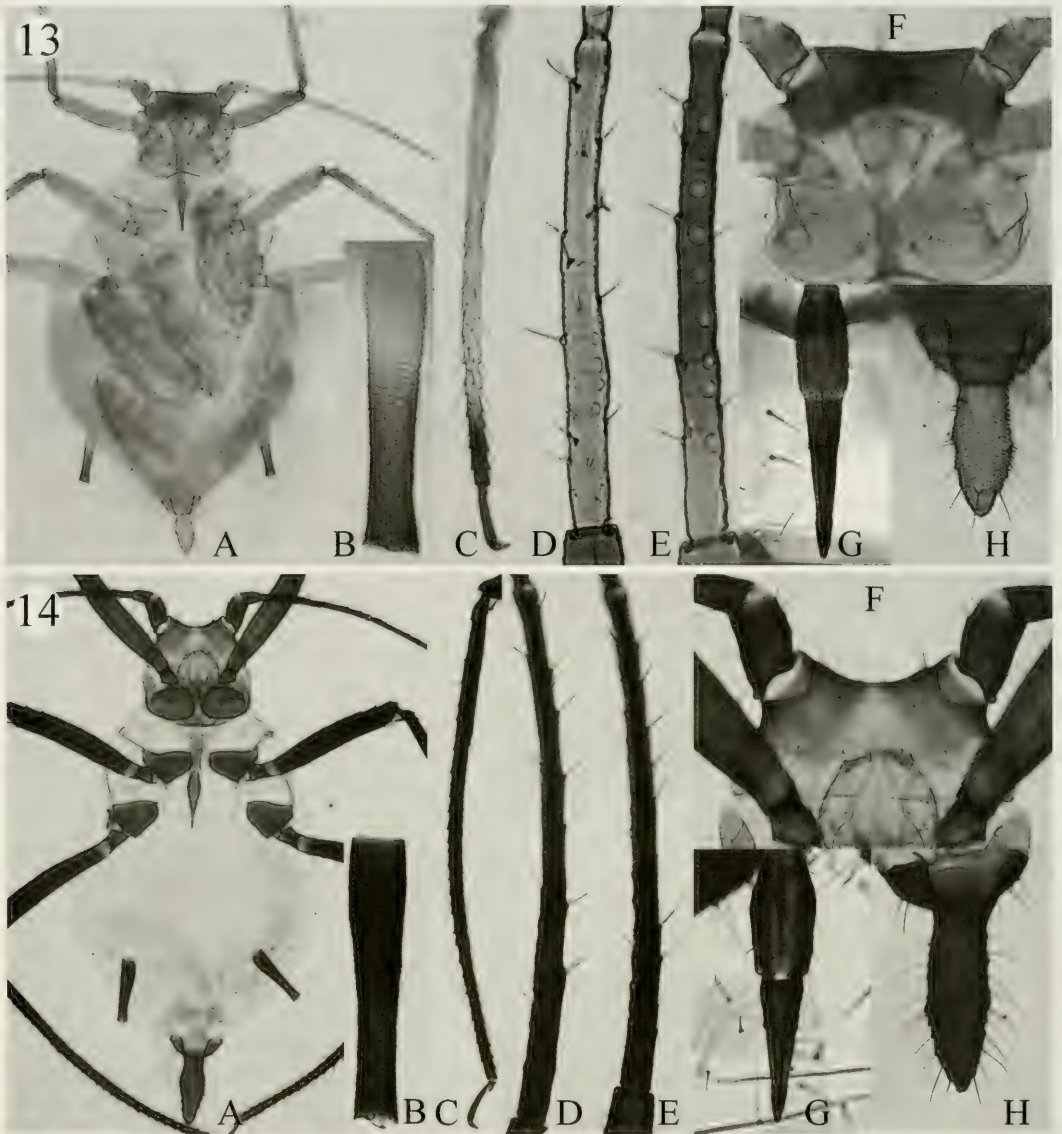
Specimens examined.—More than 40 samples containing apterous and alate viviparous females collected throughout the Korean Peninsula on *Artemisia* spp. (*annua*, *argyi*, *feddei*, *gmelini*, *iwayomogi*, *japonica*, *mongolica*, *montana*, *princeps*, *rubripes*, *stolonifera*).

Distribution.—Russia (Maritime Territory), China (Fukien, Chekiang, Szechuan, Shensi), Korea (South, North), Japan (Hokkaido, Honshu, Shikoku, Kyushu, Amami-oshima), Taiwan, Vietnam, Malaysia, India (Sikkim), Bhutan, Nepal.

Host plants.—*Artemisia* spp. (*\*annua* L., *argyi* Lev. & Van., *artica* Besser, *capillaries* Thunb., *dubia* Wall., *feddei* Lev. & Van., *gigamea* Kitam., *\*gmelini* Webb. Ex Stehm., *iwayomogi* Kitam., *\*japonica* Thunb., *mongolica* Fisch. Ex Bess., *Montana* (Nakai) Pamp., *princeps* Pamp. (incl. var. *orientalis*), *rubripes* Pamp., *sacrorum* Ledeb., *schmidtiana* Maxim., *selengensis* Turcz. ex Bess., *stolonifera* (Maxim.) Kom., *subulata* Nakai, *umbelliformis* L., *umbrosa* Turcz. ex DC., *vulgaris* L. (incl. var. *indica*)), *Chrysanthemum* (*coronarium* L., *nipponicum* Franch. ex Dammann), *Dendranthema morifolium* (Ramat) Tzvelev, *Tanacetum boreale* Fisch. Ex DC.

#### ACKNOWLEDGMENTS

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Figs. 13–14. Figs. 13–14. Apterous viviparous female (unless otherwise indicated). 13 (top), *Macrosiphoniella* (*M.*) *taesongsanensis*. 14 (bottom), *Macrosiphoniella* (*M.*) *yomogifoliae*. A, Entire body. B, Siphunculus. C, Hind tibia and tarsus. D, Antennal segment III. E, Antennal segment III of alate viviparous female. F, Head and antennal segment I–II. G, Ultimate rostral segment. H, Cauda.

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Table 2. Host plant records of *Macrosiphoniella* spp. from the Korean Peninsula. Published in Lee and Seo 1992 (1), Moritsu 1949 (1), Okamoto and Takahashi 1927 (2), Paik 1965 (3); Paik and Choi 1969 (4), Paik, Woo, and Park 1969 (5), Paik et al. 1972 (6), Szelegiewicz 1980 (7) and original data (8).

Host Plants	<i>Macrosiphoniella</i> spp.
<i>Artemisia</i> sp.:	<i>M. (A.) abrotani chosoni</i> (7), <i>M. (A.) yomogifoliae</i> (3, 7, 8), <i>M. (Ph.) grandicauda</i> (8), <i>M. (Ph.) oblonga</i> (8), <i>M. (Ph.) pallidipes</i> (8), <i>M. (S.) kuwayamai</i> (8).
<i>Artemisia annua</i> L.:	<i>M. (A.) yomenae</i> (8), <i>M. (M.) abrotani chosoni</i> (8), <i>M. (M.) pseudoartemisiae</i> (8), <i>M. (M.) yomogifoliae</i> (8).
<i>Artemisia argyi</i> Lev. & Van.:	<i>M. (M.) hokkaidensis</i> (8), <i>M. (M.) yomogifoliae</i> (8), <i>M. (Ph.) grandicauda</i> (8), <i>M. (Ph.) oblonga</i> (8).
<i>Artemisia asiatica</i> (Pamp.) Nakai ex Kitam.:	<i>M. (M.) yomogifoliae</i> (6), <i>M. (S.) kuwayamai</i> (6).
<i>Artemisia capillaris</i> Thunb.:	<i>M. (M.) atra latisiphon</i> , <i>M. (M.) capillaricola</i> , <i>M. (M.) formosartemisiae</i> (1, 2, 6, 8), <i>M. (M.) yomogifoliae</i> (6), <i>M. (S.) chaetosiphon</i> (6).
<i>Artemisia feddei</i> Lev. & Van.:	<i>M. (M.) pseudoartemisiae</i> (8), <i>M. (M.) taesongsanensis</i> (8), <i>M. (M.) yomogifoliae</i> (8), <i>M. (S.) kuwayamai</i> (7, 8).
<i>Artemisia gigamea</i> Kitam.:	<i>M. (M.) pseudoartemisiae</i> (8), <i>M. (M.) taesongsanensis</i> (8), <i>M. (M.) yomogifoliae</i> (6), <i>M. (Ph.) oblonga</i> (8).
<i>Artemisia gmelini</i> Webb. Ex Stechm.:	<i>M. (A.) yomenae</i> (8), <i>M. (M.) abrotani chosoni</i> (7), <i>M. (M.) atra latisiphon</i> (7), <i>M. (M.) taesongsanensis</i> (8), <i>M. (M.) yomogifoliae</i> (8), <i>M. (Ph.) gmelinicola</i> (7, 8).
<i>Artemisia iwayomogi</i> Kitam.:	<i>M. (M.) abrotani chosoni</i> (7), <i>M. (M.) atra latisiphon</i> (8), <i>M. (M.) jaroslavi</i> (7), <i>M. (M.) pseudoartemisiae</i> (8), <i>M. (M.) yomogifoliae</i> , <i>M. (Ph.) antennata</i> (7, 8), <i>M. (Ph.) gmelinicola</i> (7, 8).
<i>Artemisia japonica</i> Thunb.:	<i>M. (M.) atra latisiphon</i> , ? <i>M. (M.) capillaricola</i> (8), <i>M. (M.) formosartemisiae</i> (6, 8), <i>M. (M.) oronensis</i> (7), <i>M. (M.) sanborni</i> (7), <i>M. (M.) taesongsanensis</i> (8), <i>M. (M.) yomogifoliae</i> (8), <i>M. (Ph.) antennata</i> (8), <i>M. (Ph.) grandicauda</i> (8), <i>M. (Ph.) pallidipes</i> (8), <i>M. (S.) kuwayamai</i> (8), <i>M. (S.) ? yomogicola</i> (6).
<i>Artemisia lavandulaefolia</i>	= <i>A. vulgaris</i> .
<i>Artemisia keiskeana</i> Miq.:	<i>M. (M.) kikungshana</i> (7), <i>M. (M.) formosartemisiae</i> (6), <i>M. (S.) kuwayamai</i> (6).
<i>Artemisia messerschmidiana</i>	= <i>A. iwayomogi</i> .
<i>Artemisia mongolica</i> Fisch. Ex Bess.:	<i>M. (M.) hokkaidensis</i> (8), <i>M. (M.) pseudoartemisiae</i> (8), <i>M. (M.) sanborni</i> (8), <i>M. (M.) taesongsanensis</i> (8), <i>M. (M.) yomogifoliae</i> (7), <i>M. (Ph.) grandicauda</i> (8), <i>M. (S.) kuwayamai</i> (8).
<i>Artemisia montana</i> (Nakai) Pamp.:	<i>M. (M.) hokkaidensis</i> (8), <i>M. (M.) pseudoartemisiae</i> (8), <i>M. (Ph.) grandicauda</i> (8), <i>M. (Ph.) oblonga</i> (7, 8).
<i>Artemisia princeps</i> Pamp. (incl. var. <i>orientalis</i> ):	<i>M. (M.) formosartemisiae</i> (6, 8), <i>M. (M.) hikosanensis</i> (3, 7, 8), <i>M. (M.) pseudoartemisiae</i> (6, 7), <i>M. (M.) sanborni</i> (6), <i>M. (M.) taesongsanensis</i> (7, 8), <i>M. (M.) yomogifoliae</i> (8), <i>M. (Ph.) grandicauda</i> (6, 7, 8), <i>M. (Ph.) oblonga</i> (8), <i>M. (S.) hikosanensis</i> (8), <i>M. (S.) kuwayamai</i> (6, 7, 8).
<i>Artemisia rubripes</i> Pamp.:	<i>M. (A.) yomenae</i> (8), <i>M. (Ph.) hokkaidensis</i> (8), <i>M. (M.) pseudoartemisiae</i> (8), <i>M. (M.) yomogifoliae</i> (8).
<i>Artemisia scoparia</i> Waldst. & Kit.:	<i>M. (M.) formosartemisiae</i> (8), <i>M. (Ph.) grandicauda</i> (8), <i>M. (Ph.) pallidipes</i> (8), <i>M. (S.) kuwayamai</i> (8).
<i>Artemisia stolonifera</i> (Maxim.) Kom.:	<i>M. (M.) formosartemisiae</i> (8), <i>M. (M.) kikungshana</i> (8), <i>M. (M.) pseudoartemisiae</i> (8), <i>M. (M.) sanborni</i> (8), <i>M. (M.) yomogifoliae</i> (8), <i>M. (Ph.) antennata</i> (8), <i>M. (Ph.) grandicauda</i> (8).
<i>Artemisia sylvatica</i> Maxim.:	<i>M. (Ch.) myohyangsani</i> (7), <i>M. (M.) hikosanensis</i> (8), <i>M. (M.) kikungshana</i> (7, 8), <i>M. (S.) kuwayamai</i> (8).
<i>Artemisia vulgaris</i> L. (incl. var. <i>indica</i> ):	<i>M. (M.) hokkaidensis</i> (8), <i>M. (M.) kikungshana</i> (7, 8), <i>M. (M.) yomogifoliae</i> (7, 8), <i>M. (S.) kuwayamai</i> (7, 8).

Table 2. Continued.

Host Plants	<i>Macrosiphoniella</i> spp.
<i>Aster</i> sp.:	<i>M. (A.) yomenae</i> (7).
<i>Aster adustus</i> Maxim.:	<i>M. (A.) yomenae</i> (3).
<i>Aster ageratoides</i> Turcz.:	<i>M. (A.) yomenae</i> (7).
<i>Aster hayatae</i> Lev. & Van.:	<i>M. (A.) yomenae</i> (7).
<i>Aster indicus</i> Sch. Bip.	<i>M. (A.) yomenae</i> (1a)
<i>Aster koraiensis</i> Nakai:	<i>M. (A.) yomenae</i> (8).
<i>Aster tripolium</i> L.:	<i>M. (A.) asteris</i> (6, 8).
Asteraceae: Anthemideae sp.:	<i>M. (M.) pseudotanacetaria</i> (8).
<i>Conyza canadensis</i> (L.) Cronq.:	<i>M. (A.) yomenae</i> (6).
<i>Dendranthema</i> sp.:	<i>M. (M.) sanborni</i> (7), <i>M. (S.) chaetosiphon</i> (6).
<i>Dendranthema indicum</i> :	<i>M. (M.) sanborni</i> (7, 8).
<i>Dendranthema lavandulaefolium</i> (Fisch ex Trautv.) S. Kitam.:	<i>M. (M.) sanborni</i> (7).
<i>Dendranthema morifolium</i> (Ramat) Tzvelev:	<i>M. (M.) sanborni</i> (2), <i>M. (S.) chaetosiphon</i> (4).
<i>Erigeron annuus</i> (L.) Pers.:	<i>M. (A.) yomenae</i> (1, 8).
<i>Ixeris chinensis</i> (Thunb.) Nakai:	<i>M. (A.) ixeridis</i> (8).
<i>Tanacetum boreale</i> Fisch. Ex DC.:	<i>M. (M.) sanborni</i> (7, 8), <i>M. (P.) confusa</i> (8).
<i>Youngia sonchifolia</i> Maxim.:	<i>M. (A.) ixeridis</i> (8).

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